Claims

[c1] 1. A re-oxidation process of a semiconductor device, comprising:
providing a substrate having a stacked structure thereon, wherein the stacked structure includes a polysilicon/tungsten silicide interface;
forming a CVD oxide layer on the substrate and the stacked structure with a chemical vapor deposition (CVD) process; and
performing an oxidation process to form a thermal oxide layer on the substrate and the stacked structure.

[c2] 2. The re-oxidation process of claim 1, wherein the stacked structure includes a stacked gate that comprises, from bottom to top, a tunneling layer, a polysilicon floating gate, an inter-poly dielectric layer, a polysilicon control gate and a tungsten silicide layer.

[c3] 3. The re-oxidation process of claim 1, wherein the stacked structure includes a stacked gate that comprises, from bottom to top, a gate dielectric layer, a polysilicon gate and a tungsten silicide layer.

[c4] 4. The re-oxidation process of claim 1, wherein the CVD process is a low-pressure chemical vapor deposition (LPCVD) process or a plasma-enhanced chemical vapor deposition (PECVD) process.

[c5] 5. The re-oxidation process of claim 1, wherein the CVD oxide layer is formed using silane (SiH_4), tetraethyl-ortho-silane (TEOS) or dichlorosilane (SiH_2Cl_2) as a Si-source.

[c6] 6. The re-oxidation process of claim 1, wherein the CVD oxide layer has a thickness from 30 Å to 120 Å .

[c7] 7. The re-oxidation process of claim 1, wherein the oxidation process is conducted under O_2, H_2O or O_2/H_2O atmosphere.

[c8] 8. The re-oxidation process of claim 1, wherein the oxidation process is conducted in a batch-type or single wafer-type reaction chamber.

[c9] 9. A method for fabricating a semiconductor device, comprising:

sequentially forming a tunneling layer, a first polysilicon layer, an inter-poly dielectric layer, a second polysilicon layer and a tungsten silicide layer on a substrate;

sequentially patterning the tungsten silicide layer, the second polysilicon layer, the inter-poly dielectric layer and the first polysilicon layer to form a stacked gate;

forming a CVD oxide layer on the substrate and the stacked gate with a chemical vapor deposition (CVD) process; and

performing an oxidation process to form a thermal oxide layer on the substrate and the stacked gate.

[c10] 10. The method of claim 9, wherein the CVD process is a low-pressure chemical vapor deposition (LPCVD) process or a plasma-enhanced chemical vapor deposition (PECVD) process.

[c11] 11. The method of claim 9, wherein the CVD oxide layer is formed using silane (SiH_4), tetraethyl-ortho-silane (TEOS) or dichlorosilane (SiH_2Cl_2) as a Si-source.

[c12] 12. The method of claim 9, wherein the CVD oxide layer has a thickness from 30 Å to 120 Å.

[c13] 13. The method of claim 9, wherein the oxidation process is conducted under O_2, H_2O or O_2/H_2O atmosphere.

[c14] 14. The method of claim 9, wherein the oxidation process is conducted in a batch-type or single wafer-type reaction chamber.

[c15] 15. A re-oxidation process of a semiconductor device, comprising:

providing a substrate having a stacked structure thereon, wherein the stacked structure includes a polysilicon/metal silicide interface;

forming a CVD oxide layer on the substrate and the stacked structure with a chemical vapor deposition (CVD) process; and

performing an oxidation process to form a thermal oxide layer on the substrate and the stacked structure.

[c16] 16. The re-oxidation process of claim 15, wherein the stacked structure includes a stacked gate that comprises, from bottom to top, a tunneling layer, a polysilicon floating gate, an inter-poly dielectric layer, a polysilicon control gate and a metal silicide layer.

[c17] 17. The re-oxidation process of claim 15, wherein the stacked structure includes a stacked gate that comprises, from bottom to top, a gate dielectric layer, a polysilicon gate and a metal silicide layer.

[c18] 18. The re-oxidation process of claim 15, wherein the CVD process is a low pressure chemical vapor deposition (LPCVD) process or a plasma enhanced chemical vapor deposition (PECVD) process.

[c19] 19. The re-oxidation process of claim 15, wherein the CVD oxide layer is formed using SiH_4, tetraethyl-ortho-silane (TEOS) or dichlorosilane (SiH_2Cl_2) as a Si-source.

[c20] 20. The re-oxidation process of claim 15, wherein the CVD oxide layer has a thickness from 30 Å to 120 Å.